Two-Channel Front Panel
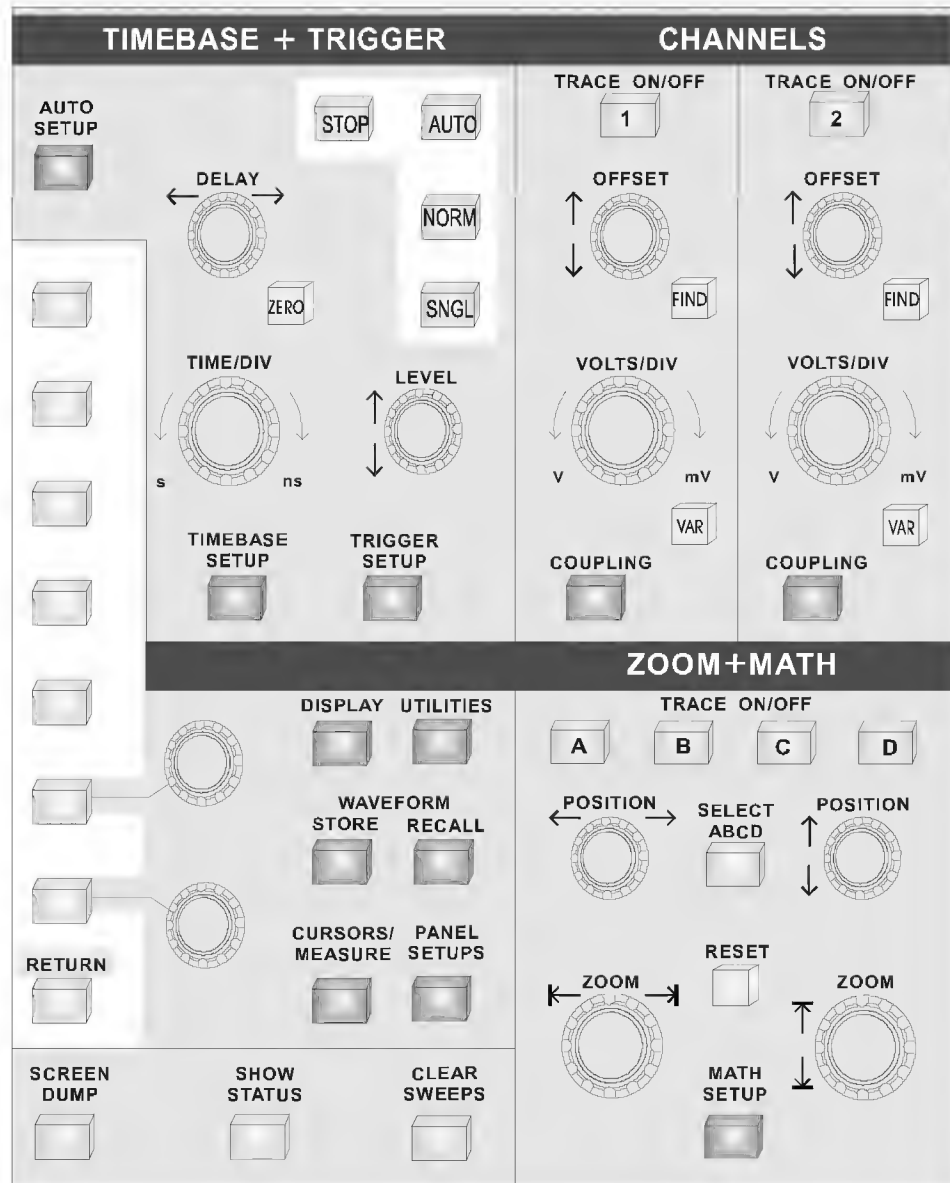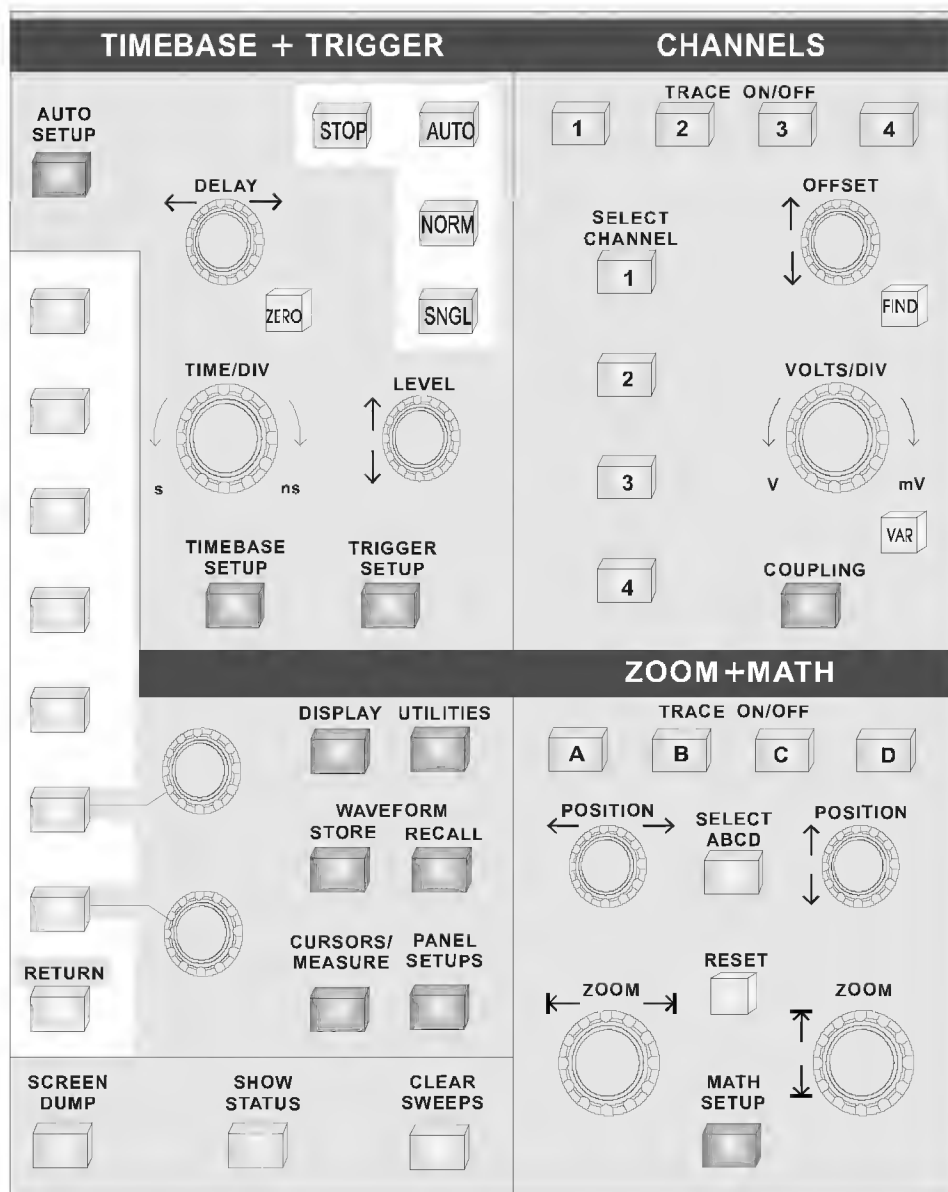
Four-Channel Front Panel

The Main Controls

The front panel controls are divided into four main groups of buttons and knobs: the System Setup and menu controls, CHANNELS, TIMEBASE + TRIGGER and ZOOM + MATH.

System Setup

Dark-gray, menu-*entry* buttons, also represented in the other groups of controls, provide access to the main on-screen menus and the acquisition, processing and display modes of the instrument.

The SCREEN DUMP, SHOW STATUS and CLEAR SWEEPS buttons, respectively: copy or print the screen display, show on-screen summaries of the scope's status, and restart operations that require several acquisitions. *See page 4–6.*

Menu Buttons & Knobs

The seven untitled buttons vertically aligned beside the screen, RETURN and the two linked rotary knobs enable on-screen menu selection. *See following pages.*

CHANNELS

This group offers selection of displayed traces and adjustment of vertical sensitivity and offset. *See Chapter 5.*

AUTO SETUP

This singular blue button automatically adjusts the scope to acquire and display signals on the input channels. *See Chapter 6.*

TIMEBASE + TRIGGER

These controls allow direct adjustment of time/division, trigger level and delay, as well as access to the "TIMEBASE" and "TRIGGER" menu groups. *See Chapters 6, 7 and 8.*

ZOOM + MATH

And this group controls trace selection, movement, definition, and expansion with Zoom and Math functions. *See Chapters 9 and 10.*
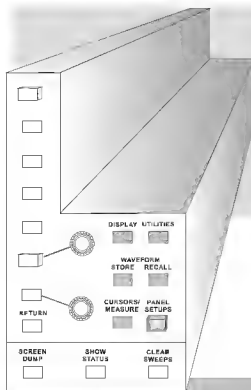
See also "Getting Started", Part 2 of the Hands-On Guide, for more on the front-panel and a complete run-through of the controls...

Choosing and Navigating in Menus

On-screen menus — the panels running down the right-hand side of the screen — are used to select specific scope actions and settings. All other on-screen text is for information only. The menus are broadly grouped according to function. The name of each menu group is shown at the top of the column of menus. Individual menus also have names in the top of their frames.

```
┌─SET CLOCK─┐
│FORWARD ONE│
│HOUR (SPRING)│
└───────────┘
```

Each menu either contains a list of items or options — functions to be selected or variables modified — or when selected performs a specific action. Menus that perform certain actions are indicated by capitalized text, *as in the example shown at left.*
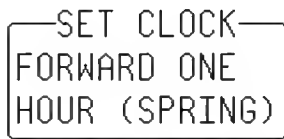
Going to Menus and Selecting from them
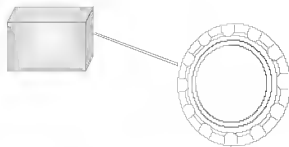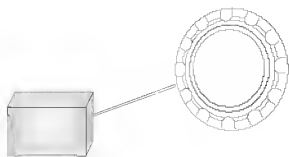
When a menu-*entry* button 🔲 is pressed, the set-up configuration for its particular group of functions is immediately displayed on-screen as a menu group. Once accessed, these menus are controlled using the menu buttons and the two menu knobs (*illustrated at left*).

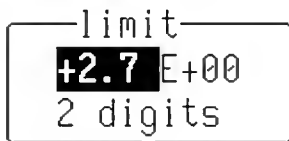A menu button 🔲 is active and can be pressed to make selections whenever a menu is visible beside it on-screen.

The two menu knobs ⬡ work together with the two menu buttons to which they are joined by lines. Both control the menus currently shown beside them. Buttons and knobs are used either for selecting entire menus, particular items from menus, for moving up or down through menu lists, or for changing the values listed in menus.
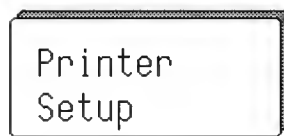
Some menus, referred to as *primary*, have *secondary* menus beneath them whose existence is indicated by a heavy outline or shadow, *as illustrated at left.* Pressing the corresponding menu button reveals and activates these 'hidden' menus. Pressing the RETURN button again displays the top, or primary, menu.

```
┌──────────┐
│ Printer  │
│ Setup    │
└──────────┘
```

Changing a menu value normally changes the screen, because the new value is immediately used in acquisition settings, processing or display.

Setting Menu Options

```
┌─Math Type─┐
│Enh.Res    ▌
│Extrema    │
│███        │
│ FFT       │
│FFTAVG     │
│Functions  ▌
└───────────┘
```

```
┌─trigger on─┐
│Line   Field│
│███         │
│266      2  │
└────────────┘
```

```
┌──limit──┐
│███ E+00 │
│+2.7     │
│2 digits │
└─────────┘
```
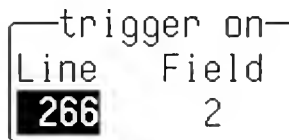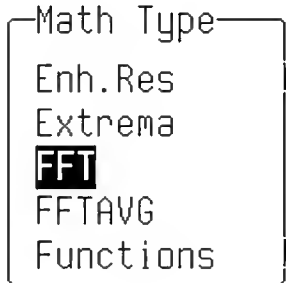
The activated selection is highlighted in the menu. Press the corresponding menu button and the field will advance to highlight and select the next item on the menu. However, if there is only one item on a menu, pressing its button will have no effect.

Where a menu is associated with one of the two menu knobs, turning this knob in one direction or the other will cause the selection to move either up or down the list in the menu.

Menus that extend along the length of two menu buttons can be operated using both buttons. Pressing the lower of the two will move the highlighting forward — down the list — while pushing the upper will move the selector back up the list.

An arrow on the side of a menu frame indicates that by pressing the button beside this arrow, the selection can be moved further up or down the list. The arrow's direction shows whether the highlighting selector will move up or down. Arrows may also indicate items that are not visible, either above or below on the list. The respective arrow will disappear when the selection is at the very beginning or end of the list.

As in the examples at left, some menu button and knob combinations control the value of a continuously adjustable variable. The knob is then used to set its value, while the button either selects a value or makes a simple change in it.

Still other menu button and knob combinations control the value of several continuously adjustable variables, with the knob used to set the value and the button to highlight it.

> *__Note:__ When the oscilloscope is placed in a remote state, the REMOTE ENABLE menu will be displayed. It will contain the command "GO TO LOCAL", activated by menu button if the action is possible. This is the only manual way to turn off the REMOTE ENABLE menu. The scope need not be in remote state to accept remote commands.*

System Setup and Menu Controls
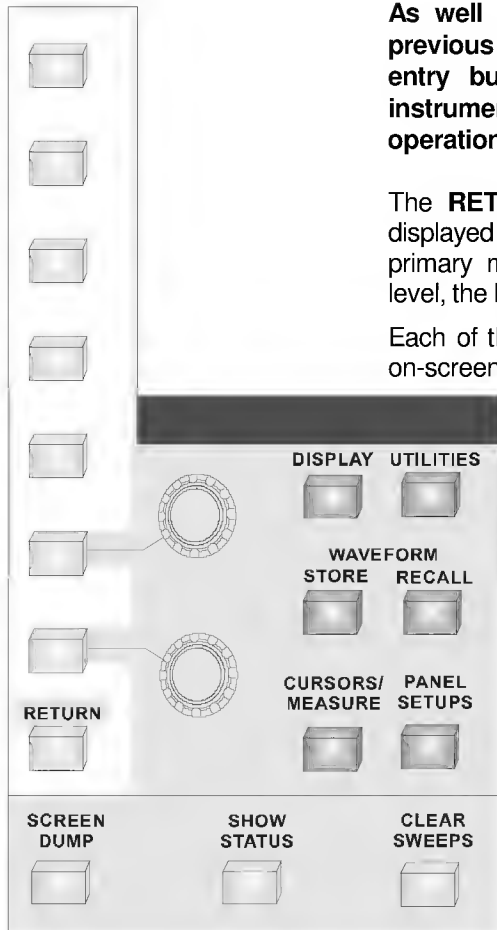
As well as the menu buttons and knobs described on the previous pages, the System Setup controls include the menu-entry buttons and others for copying displays, reporting instrument status and restarting multiple-acquisition operations.

The **RETURN** button is used to go back to the preceding displayed menu group. Or it returns the display to a higher-level, or primary menu. But when the display is at the highest possible menu level, the button switches off that menu.

Each of the dark-gray menu-entry buttons activates a major set of on-screen menus (*those represented in the other control groups are described in the following chapters, along with the other elements in the groups*).

The **DISPLAY** button provides entry to the "DISPLAY SETUP" group of menus, controlling display mode, grids, intensities, Dot Join and Persistence menus. *See Chapter 11.*

The **UTILITIES** button gives access to the "UTILITIES" menus, controlling hardcopy setups, GPIB addresses and special modes of operation. *Chapter 12.*

The **WAVEFORM STORE** button accesses the "STORE W'FORM" menus, used for storing waveforms to internal or external memory. *Chapter 13.*

Whereas, **WAVEFORM RECALL** calls up "RECALL W'FORM": menus for retrieving waveforms stored in internal or external memory. *Chapter 13.*

CURSORS/MEASURE offers up the "CURSORS" Setup menus, used for making precise cursor measurements on traces, and "MEASURE", for precise parameter measurements. *Chapter 14.*

And **PANEL SETUPS** [ ] gives access to the "PANEL SETUPS" menus for saving and recalling a configuration of the instrument. *See Chapter 13.*

SCREEN
DUMP

[ ] **SCREEN DUMP**

— prints or plots the screen display to an on-line hardcopy device, via the GPIB, RS-232-C or Centronics interface ports, or directly to an external thermal graphics printer. Hardcopies can also be generated as data files onto floppy, memory card or portable hard disk.

Once SCREEN DUMP is pressed, *all* displayed information will be copied. However, it is possible to copy the waveforms without the grid by turning the grid intensity to 0 with the "Display Setup" menu.

While a screen dump is taking place — indicated by the on-screen "PRINTING" or "PLOTTING" message — it can be aborted by pressing SCREEN DUMP a second time. It will take a certain amount of time for the buffer to empty before copying stops.

CLEAR
SWEEPS

[ ] **CLEAR SWEEPS**

— restarts operations requiring several acquisitions, or sweeps, including averaging, extrema, persistence and pass/fail testing, by resetting the sweep counter(s) to zero.
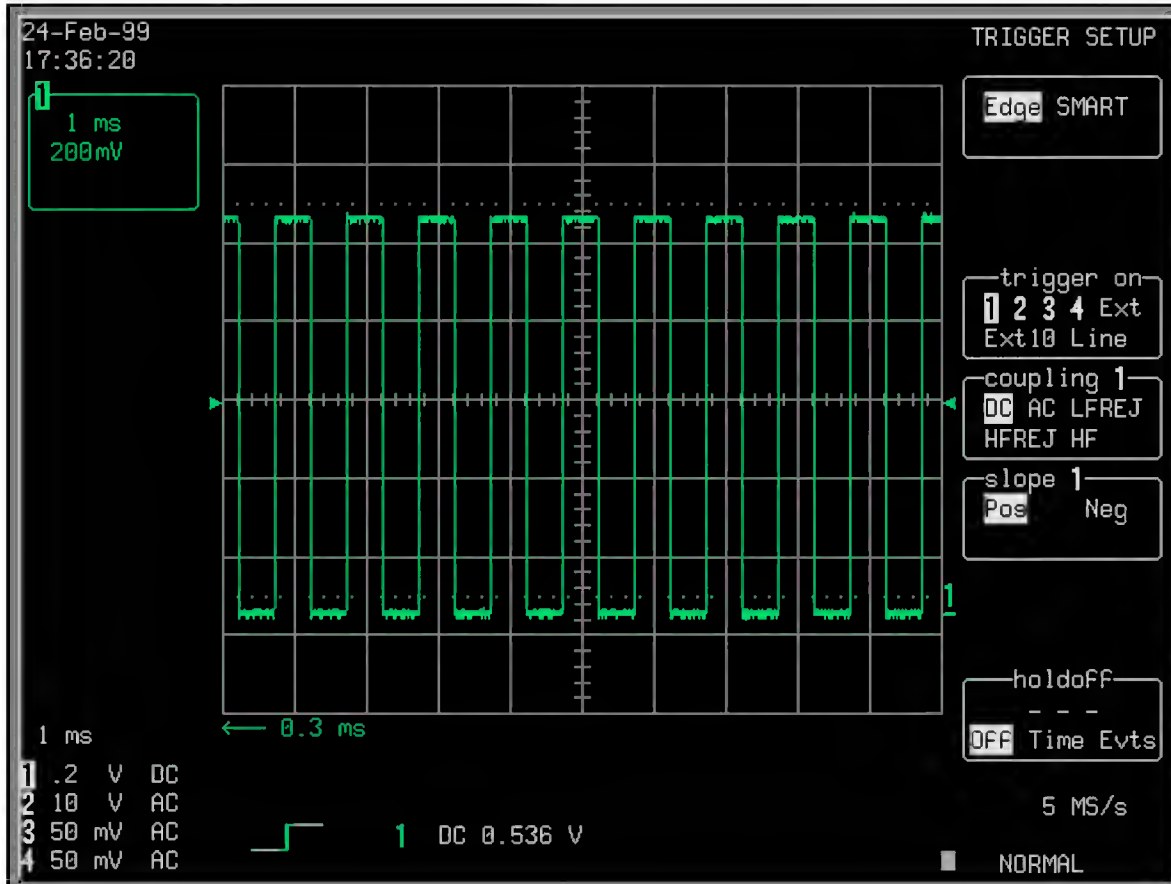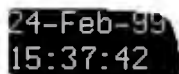
SHOW
STATUS

[ ] **SHOW STATUS**

— menu entry to "STATUS", which shows summaries of the instrument's status for acquisition, system and other aspects. *See Chapter 16.*

Screen Topography


```
24-Feb-99                                            TRIGGER SETUP
17:36:20

    1 ms                                              Edge  SMART
  200mV

                                                      ─trigger on─
                                                       1 2 3 4 Ext
                                                       Ext10 Line

                                                      ─coupling 1─
                                                       DC AC LFREJ
                                                       HFREJ HF

                                                      ─slope 1─
                                                       Pos     Neg


                                                   1

                                                      ─holdoff─
                                                        - - -
  1 ms           ← 0.3 ms                             OFF Time Evts
  1  .2  V  DC
  2 10  V  AC                                          5 MS/s
  3 50 mV  AC         ⌐       1  DC 0.536 V
  4 50 mV  AC                                       ■  NORMAL
```

The sections of the screen shown here and described below, which surround the grid, contain a variety of useful information as well as accessing specific commands and functions.
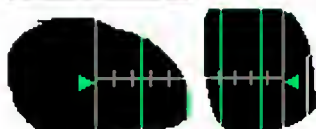
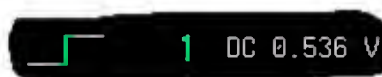**Real-Time Clock field:** powered by a battery-backed real-time clock, it displays the current date and time.

Displayed Trace Label indicates each channel or channel displayed, the time/div and volts/div settings, and cursor readings where appropriate. It indicates the acquisition parameters set when the trace was captured or processed, while the Acquisition Summary field (below) indicates the present setting.

Acquisition Summary field: timebase, volts/div, probe attenuation and coupling for each channel, with the selected channel highlighted. It indicates the present setting, while the acquisition parameters set when the trace was captured or processed are indicated in the Displayed Trace label (above).

Trigger Level arrows on both sides of the grid that mark the trigger voltage level relative to ground level.

Trigger Delay: an arrow indicating the trigger time relative to the trace. The delay can be adjusted from zero to ten grid divisions (pre-trigger), or zero to −10 000 (post-trigger) off-screen. Pre-trigger delay appears as the upward-pointing arrow, while post-trigger is given as a delay in seconds.

Trigger Status field shows sample rate and trigger re-arming status (AUTO, NORMAL, SINGLE, STOPPED). The small square icon flashes to indicate that an acquisition has been made.

Trigger Configuration field: icon indicating type of trigger, and information on the trigger's source, slope, level and coupling, and other information when appropriate.

Trace and Ground Level: trace number and ground-level marker.

Other Fields
(*not illustrated here*)

Time and Frequency field: displays time and frequency relative to cursors beneath the grid. For example, when the absolute time cursor (the cross-hair) is activated by selection from the "MEASURE" menu group, this field displays the time between the cursor and the trigger point.

Message field: used to display a variety of messages, above the grid, including warnings, indications and titles showing the instrument's current status.

General Instrument Reset: Simultaneously press the AUTO SETUP button, the top menu button, and the RETURN button. The scope will revert to its default power-up settings.

Press: AUTO SETUP ⬜ + ⬜ + RETURN ⬜ !